REMR TECHNICAL NOTE GT-SE-1.1

USDA SOIL CONSERVATION SERVICE SPILLWAY EROSION STUDIES

PURPOSE: To identify a source of information on spillway erosion problems; i.e., Soil Conservation Service Spillway Erosion Studies.

APPLICATION: Coordination with the US Department of Agriculture, Soil Conservation Service, Northeast Technical Service Center, can provide information of local spillway erosion problems and potential problems at similarly sited Corps dams.

ADVANTAGES: Permits assessment of potential problems before spillway erosion occurs.

AVAILABILITY: Information has been developed on spillway erosion incidents at 40 SCS dams in Arkansas, Kentucky, and Mississippi. Complete case studies are available for selected dams in Arkansas.

BACKGROUND: The Soil Conservation Service (SCS) has built approximately 8,000 dams and has been involved in the construction of 17,000 dams since 1954. SCS dams are generally constructed with emergency spillways excavated in soil or rock. The effects of erosion on the spillways have been observed, but a comprehensive data collection program did not begin until a special task group was formed in 1983. The Emergency Spillway Flow Study Task Group was charged with the responsibility of gathering and analyzing data and preparing summaries and reports. The goals of this task group are to:

a. Confirm or improve present design criteria for spillways in a variety of rock and soil materials.

b. Give an indication of the upper limits of applicability of various types of spillways.

c. Show the extent and cost of spillway maintenance required after flood flows.

At each major discharge (water depth over 3 ft at the inlet or spillway flow for more than 7 days) the spillway research team looks at the flow regime and the erosional effects on the spillway. A detailed hydrologic/geologic report is prepared for each case study. Geologic data include: rock type, attitude, width and spacing of fractures, percentage of core recovery, rock quality designation, and weathering condition. The site is generally surveyed topographically to determine the amount of erosion.

The SCS case studies are a valuable resource for the Corps of Engineers in predicting potential spillway erosion problems in that SCS dams are often sited

in geologic terrains similar to Corps dams, and geologic features are often comparable. Flow velocities, slope, and effects of special structural features are also noted in each case study and can be compared to projections for Corps structures.

The SCS program will continue and reports on SCS dams in Mississippi and Kentucky are scheduled for publication. Case studies for dams in these states are presently available although not formally published.

REFERENCES: a. Spillway performance report. US Department of Agriculture, Soil Conservation Service, Washington, DC, 1984. National Bulletin No. 210-4-14.